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PTO/SB/05 (4/98)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. TRI3-L92a
First Inventor or Application Identifier Leslie L. Kerek
Title HOODLESS ELECTRICAL SOCKET CONTACT
Express Mail Label No. EJ784824900US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

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1. ☒ * Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Specification [Total Pages 22]
(preferred arrangement set forth below)
 - Descriptive title of the Invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 5]
4. Oath or Declaration [Total Pages 2]
 - a. ☒ Newly executed (original or copy)
 - b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
 - i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

5. ☐ Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
 - a. ☐ Computer Readable Copy
 - b. ☐ Paper Copy (identical to computer copy)
 - c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☒ Assignment Papers (cover sheet & document(s))
8. ☐ 37 C.F.R. § 3.73(b) Statement ☒ Power of Attorney
(when there is an assignee)
9. ☐ English Translation Document (if applicable)
10. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
13. ☐ * Small Entity Statement(s) ☐ Statement filed in prior application,
(PTO/SB/09-12) Status still proper and desired
14. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
15. ☐ Other:

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No. 94 / 104,733
Prior application information: Examiner J. Nasri Group / Art Unit: 2839

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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PATENT

HOODLESS ELECTRICAL SOCKET CONTACT

RELATED APPLICATION

This application is a continuation-in-part of my pending application serial no. 09/104,733 filed June 25, 1998 entitled Hoodless Electrical Socket Connector.

FIELD OF THE INVENTION

This invention relates generally to electrical contacts, and more particularly, it is directed to a hoodless socket contact and method for making the same.

BACKGROUND OF THE INVENTION

Electrical contacts are present in all avionics, military and aerospace equipment environment such as in helicopters, missiles and planes. Such equipment may have dozens or even hundreds or even thousands of electrical connections that must be made between electronic power supplies, sensors, activators, circuit boards, bus wiring, wiring harnesses, to provide the electrical pathways or highways needed to transport electricity in the form of control signals and power. The hardware reliability requirements for operating in an avionics environment are stringent as a failure can

1 have catastrophic consequences. As such, the
2 electrical components and circuitry, as well
3 as the connectors and contacts therein
4 employed to electrically connect these items,
5 must work in a wide range and wide variety of
6 environmental conditions such as mechanical,
7 vibration, wide temperature ranges, humidity
8 and corrosive elements, etc. For example,
9 military standards (also known in the
10 industry as mil specs) for aircraft avionics
11 equipment require that contacts be able to
12 mate and unmate a minimum of five hundred
13 times without a failure during all
14 anticipated environmental and mechanical
15 conditions. In addition, the contact
16 assemblies must be protected to withstand
17 repeated handling without significant
18 distortion or damage to the interconnecting
19 parts which could lead to a lack of
20 electrical continuity.

21 One example of a high-amperage power
22 socket contact or terminal is illustrated in
23 US Patent 5,376,012 "Power Port Terminal" to
24 Clark which includes a contact socket
25 receiving portion and an integral mounting
26 portion. The socket includes a web with a
27 plurality of beams thereon. Each of the beams
28 has a curved surface with a bend, which beams
29 cooperate to form an axially extending
30 tubular socket region which accepts a pin
31 terminal of any desired length.
32 Disadvantageously, the beams are exposed and
33 therefore subject to damage. Additionally,
34 the beams of the socket contact are not
35 protected from entry of an oversize male

1 contact, which may bend the beams beyond
2 their elastic limit thereby damage the
3 connector so that it will not perform
4 electrically.

5 Another example of a socket contact is
6 illustrated in US Patent 4,906,212 entitled
7 "Electrical Pin and Socket Connector" to
8 Mixon, Jr. which includes a socket have a
9 cylindrical mating portion defined by
10 cantilever beams having one or more blades
11 wherein one or more of the blades include a
12 rearwardly extending free end. The pin
13 includes a mating portion having a bullet
14 nose at one end and a wire barrel at another
15 end. This connector suffers from the same
16 limitations as the Clark connector and
17 therefore is an undesirable alternative in
18 environments where high reliability is
19 critical.

20 A prior art female contact which is used
21 in non-critical and in non-aerospace
22 applications is shown in Fig. 1 which contact
23 includes a cylindrical member 10 having holes
24 12 and 14 in the ends thereof. A spring
25 member 16 is inserted in one of the ends, the
26 spring member tapering rearwardly into the
27 hole 12. Accordingly, a male pin contact
28 inserted into the cylindrical member 10 would
29 be grasped by the spring member 16 relatively
30 deeply within the hole 12 which is
31 disadvantageous. The distance from the free
32 end 15 of the socket to the point of
33 engagement 17 with a male contact or pin is
34 designated by the letter "L" in Fig. 1 (and
35 in Fig. 2). The particular connector halves

1 in which the male and female contacts are
2 used (and the positioning of the connector
3 halves on the equipment, e.g., trays and
4 black boxes) may result in a lesser or
5 greater penetration of the male pins into the
6 socket body. Furthermore, there is no
7 mechanical structure to ensure that the
8 spring member 16 will remain in place and as
9 such the spring may "walk out" of the hole
10 during vibration or during mating and
11 unmating cycles. Mil specs require that a
12 spring member which provides the electrical
13 continuity must be able to withstand the
14 separation force during the unmating cycle
15 (i.e., 500) without being dislodged under all
16 anticipated environmental conditions
17 including vibration. The arrangement of the
18 spring 16 socket member 10 could be
19 potentially hazardous if used in avionics
20 environments where high reliability is a must
21 for human safety.

22 Another example of a socket contact that
23 is successfully manufactured and sold by the
24 assignee of the present invention is shown in
25 Fig. 2. This contact 20, sometimes referred
26 to as a hooded socket contact, includes a
27 tubular socket body 22 having a plurality of
28 tines 24 for receiving a male contact or pin.
29 A hood 26 is inserted over the tines 24 and
30 rear portion of a contact to protect the
31 tines from damage. The hood is generally
32 made of stainless steel with a wall thickness
33 of only .004 to .010" for economic and
34 reliability reasons. The hood is press fit
35 over the cylindrical shoulder portion 28 at

1 the rear of the contact. This press fit
2 arrangement, due to the hood's wall
3 thickness, requires precision manufacturing.
4 Improper sizing of the socket body shoulder
5 may result in damage to the hood during the
6 press fit operation or the hood may come
7 loose during use. Plating of the contact may
8 exacerbate the press fit step during
9 manufacturing. Furthermore, a stainless
10 steel hood may not be tolerated in certain
11 applications where interference with magnetic
12 fields is a problem. In summary, the
13 manufacturing steps necessary to insure
14 reliable performance of the hooded type
15 contact shown in Fig. 2 may result in a
16 fairly expensive contact when mass produced.

17 Accordingly, there is a need for an
18 improved socket contact that is simple to
19 manufacture yet reliable in performance and
20 that can be made in mass quantities at
21 relatively low cost.

22 SUMMARY OF THE INVENTION

23 The foregoing mentioned disadvantages
24 are avoided by providing a hoodless socket or
25 female contact for engaging a male pin
26 contact. The female contact includes a socket
27 body with two ends, each end having an
28 axially oriented hole or bore. A spring for
29 making an electrical connection with a male
30 contact or pin is located in one of the
31 holes. The spring is arranged for
32 resiliently engaging the male pin contact in
33 close proximity to the hole entry point or
34 free end of the socket body. Means are
35 provided for securely holding the spring in

1 the hole, which may be established by a press
2 fit of the spring within the hole coupled
3 with an extension of the socket body
4 overlaying a portion of the spring thereby
5 preventing the spring from exiting from the
6 socket body.

7 Alternatively, the spring may be
8 securely coupled in the socket body by
9 crimping the socket body onto the spring.
10 Preferably, this is achieved by crimping a
11 portion of the socket body into a peripheral
12 annular groove in the spring. Barbs on the
13 spring, which engage the inner wall of the
14 hole of the socket body, may also be
15 employed, with or without crimping, to
16 provide additional security.

17 The hole at the other end of the socket
18 body is sized and shaped to receive a
19 conductor such as a insulated copper wire.
20 The conductor may be electrically and
21 mechanically secured together with the socket
22 body by crimping the socket body onto the
23 conductor.

24 The construction and operation of
25 preferred embodiments of the contact of the
26 present invention may best be understood by
27 reference to the following description taken
28 in conjunction with the accompanying drawings
29 in which like components or features are
30 designated by the same or primed reference
31 numbers.

32 BRIEF DESCRIPTION OF THE DRAWINGS

33 FIG. 1 is a side cross-sectional view of
34 a prior art contact;
35

1 FIG. 2 is a side cross-sectional view of
2 another prior art contact;

3 FIG. 3 is a side cross-sectional,
4 partially broken away side view of a socket
5 contact in accordance with the principles of
6 the invention illustrating the two parts of
7 the socket contact prior to assembly;

8 FIG. 4 is a side cross-sectional,
9 partially broken away side view of the
10 contact parts of Fig. 3 assembled together;

11 FIG. 5 is a side view of a stamped out
12 spring prior to roll forming;

13 FIGS. 6A and B are cross-sectional views
14 illustrating a spring made from roll forming
15 ("seam type") or deep drawn ("seamless type")
16 processes, respectively;

17 FIG. 7 is a side cross-sectional view of
18 the spring with dimples;

19 FIGS. 8A-C are partial side cross-
20 sectional views of the back end of the spring
21 with optional groove configurations therein;

22 FIG. 9 is a cross-sectional side view of
23 an assembled socket contact that has been
24 crimped;

25 FIG. 10 is a cross-sectional view of
26 another assembled socket contact wherein the
27 two parts are assembled together and in
28 addition are also retained by barbs and a
29 pin terminal is inserted into the socket
30 contact;

31 FIG. 11 is a cross-sectional side view
32 illustrating the two parts of the socket
33 contact prior to assembly with an electrical
34 conductor;
35

FIG. 12 is a cross-sectional side view of the socket contact with metal stands of an insulated conductor wire inserted into the rear portion of the socket body prior to crimping, and

FIG. 13 is a partially broken away side view of the socket contact with the rear portion of the socket body crimped onto the wire strands.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and more particularly to Figs. 3 and 4, there is shown a socket contact generally indicated by reference number 30. The socket contact, sometimes hereinafter referred to as a hoodless socket, is made from two parts including a socket body 32 and a spring 34. The socket body 32 consists of a cylindrically or tubularly shaped member 36 having two ends, with an axially disposed male-contact-receiving hole or bore 38 extending from one of the ends 40 (i.e., free end) into the socket body a preselected distance and a conductor or wire receiving hole of bore 39 at the other end 41 thereof. See Fig. 11. The socket body 32 may be made of an electrically conductive material such as a brass/copper alloy. The male-contact-receiving hole 38 may have an inwardly projecting shoulder 42 that provides a back stop for the seating of the spring 34.

The spring 34 contains a forward male contact receiving portion 44 and a rear mounting portion 46. The contact receiving portion 44 includes a plurality of fingers or

1 tines 50. The fingers are arranged around the
2 longitudinal axis 52 of the spring 34 and are
3 separated by gaps or slots 54 between
4 adjacent fingers. Each of the forwardly
5 extending fingers tapers inwardly to define
6 together a tubularly shaped contact region 56
7 and 58 which engages a male pin inserted
8 therebetween and to provide a reliable
9 electrical connection therebetween under
10 anticipated adverse conditions. The portion
11 of the fingers forward of the contact region
12 56 bend outwardly to form a flared region 57
13 which acts as a centralizer for guiding the
14 insertion of a male pin. The tubularly shaped
15 contact region 56 at the bends define an
16 annular contact surface 58 at a preselected
17 point 60 along the axis 52. The preselected
18 point for annular contact surface 58 of the
19 spring 34 is spaced within about .020 to .045
20 inches, and preferably about .035 inches
21 maximum, from the free end 40 of the socket
22 body when the spring contact is secured
23 therewith, i.e., equals about .020" to .045"
24 and preferably about .035" maximum. The
25 aforescribed arrangement between the socket
26 body and spring thus allows electrical
27 contact to be made with a male contact close
28 to the end 40 of the socket body. This
29 advantageously provides electrical contact to
30 be made immediately essentially upon coupling
31 a male contact (not shown) to the hoodless
32 female contact 30, as required by the
33 applicable mil specs.
34
35

1 The spring 34' may be of the seam type
2 in which case it is made in a flat
3 configuration, as illustrated in Fig. 5, and
4 then roll formed into the form of a sleeve. A
5 small gap 37 is formed between the edges 51,
6 as shown in Fig. 6A. This gap may visually
7 disappear as a result of the roll formation
8 and press fit steps. Alternatively, the
9 spring 34' may be of the seamless type made,
10 for example, by deep drawing process well
11 known in the art, as shown in Fig. 6B.

12 While the fingers 50 described
13 hereinabove provide good electrical
14 continuity to a male terminal, increased
15 electrical contact may be established by
16 providing the contact region 56 with inwardly
17 disposed dimples 62, as shown in Fig. 7.
18 While the dimples could be disposed on the
19 same radial plane, preferably the dimples 62
20 are staggered on the fingers 50, i.e.,
21 disposed at different axial distances from
22 the free end of the socket body as shown more
23 particularly in Fig. 5. This advantageously
24 reduces the insertion force needed to insert
25 a male pin between the fingers 50 than when
26 the dimples 62 are all on the same radial
27 plane, while increasing the retention force
28 provided by the fingers 50. Additionally, by
29 staggering the dimples 62, the resonance
30 point of the individual fingers 50 will vary
31 during vibration, thus mitigating open
32 circuit faults. Fingers having different
33 widths "W", as illustrated in Figure 5, also
34 aid in overcoming the resonance problem
35 encountered with conventional spring

1 contacts. The dimples 62 further assure that
2 a gas-tight connection is established between
3 the fingers and a male contact. Such a gas-
4 tight connection seals out corrosive gases
5 and thereby prevents formation of films or
6 corrosives on the surfaces interconnecting
7 the mating male/female contacts that could
8 degrade the electrical conductivity
9 therebetween and cause failures in the
10 connection. It should be noted that dimples
11 or fingers having differing widths may not be
12 necessary in many applications.

13 The spring 34 may be retained within the
14 hole 38 of the socket body 32 by inserting
15 the contact into the socket body with a press
16 fit configuration and thereafter rolling the
17 free end of the socket body radially inwardly
18 to form an annular shoulder 53 which will
19 engage end 35 of the spring in the event that
20 a sufficient force is applied to the spring
21 tending to pull the spring out of the socket
22 body. See Fig. 4. Alternatively, or in
23 addition thereto, the rear mounting portion
24 46 of the spring contact may have an annular
25 groove 70 therein, shown with more
26 particularity in Fig. 8A. After assembly,
27 the wall of the socket body 32 may be roll
28 crimped such that a portion 59 of the socket
29 body wall is rolled into the groove 70, as
30 shown in Fig. 9. The rear mounting portion 46
31 of the spring 34 may have a variety of groove
32 configurations, as shown with more
33 particularity in Figs. 8A-C.

34
35

1 Another means for retaining the spring
2 in the socket body is shown in Fig. 10. In
3 this embodiment, the rear mounting portion 46
4 of the spring has a plurality of outwardly
5 extending spring retention barbs 80. The
6 barbs 80 resiliently compress inward upon
7 insertion of the spring 34 into the hole 38,
8 but dig into the inner wall 38 of the hole to
9 resist removal. As further illustrated in
10 Fig. 10, the pin portion 92 of a male contact
11 90 is inserted between fingers 50 which
12 spread to resiliently grasp the pin portion
13 92 via the dimples 62. It should be noted
14 that the dimples 62 are optional.

15 Figs. 11-13 illustrate an attachment
16 mechanism for electrically connecting the
17 socket body 32 to an electrical conductor
18 102, such as a conventional insulated copper
19 wire, for example. The socket body wire
20 receiving end 41 opens to a rear hole or
21 blind bore 39 which receives the copper
22 strands 100 of insulated wire 102. The front
23 and rear bores 38 and 39 are closed by end
24 walls 38a and 39a, respectively, formed by
25 center section 32a of the socket body. The
26 socket body 32 includes a pair of spaced
27 radially extending shoulders 32b.

28 As is shown in Fig. 12, the wire strands
29 100 of the conductor 100 are inserted a
30 predetermined distance into hole 39, which
31 insertion may be aided by a small viewing
32 hole 104 (shown in Fig. 13). The distal end
33 wall 39a of the hole 39, in any event, limits
34 the insertion distance of the wire. A
35 selected portion 106 of the socket body 32,

1 extending over the wire strands 100, is
2 crimped onto the wire strands to make good
3 electrical contact therewith and mechanically
4 hold the wire strands 100 in the socket body
5 32, as shown in Fig. 13. Advantageously, the
6 socket body while serving to hold and protect
7 the spring also provides for direct
8 attachment to conductor wires and the like
9 without the need for additional parts. It
10 should be noted that while it is preferable
11 to provide separate front (first) and rear
12 (second) holes, 38 and 39, respectively,
13 separated by a center section 32a of the
14 socket body, the hole or bore could be
15 continuous, i.e., one long bore.

16 There has thus been described an
17 improved contact arrangement which can be
18 cost effective manufactured on a repetitive
19 basis. This spring is protected from damage
20 by the socket body. The dimples, when
21 utilized, provide an increased gas tight
22 point(s) of contact, allowing thinner or less
23 noble electrical conductive plating to be used
24 on the fingers. Optionally, staggering the
25 dimples reduces the overall mating and
26 unmating force while maintaining a desired
27 gas tight seal between the fingers and the
28 male contact. Accordingly, various
29 modifications of the hoodless socket, and
30 processes involved in manufacturing the
31 contact terminal, will occur to persons
32 skilled in the art without involving any
33 departure from the spirit and scope of the
34 invention as set forth in the appended
35 claims.

WHAT IS CLAIMED IS:

1 1. A hoodless female contact for engaging a
male pin comprising:

 a socket body having two ends with
 at least one axial hole defining an
5 open free male contact receiving end
 and an open wire-receiving end for
 connection with an electrical
 conductor; and

 a spring located in the hole
10 defining the male contact receiving
 end, including a forward portion and
 rear portion, the forward portion
 having a plurality of forwardly and
 inwardly extending fingers which
15 terminate near the free male contact
 receiving end for resiliently grasping
 the male pin in close proximity to the
 free end.

1 2. The contact defined in claim 1 wherein
the fingers grasp the male pin about .025 to .045
inches from the free end of the socket body.

1 3. The contact defined in claim 2 wherein
the fingers flare out at the ends thereof for
facilitating insertion of the male pin in between
the fingers.

1 4. The contact defined in claim 1 wherein
each of the fingers has an inwardly disposed
dimple which engage the male pin.

1 5. The contact defined in claim 4 wherein
the dimples are disposed along the extent of the
fingers at different axial distances from the free
end of the socket body.

1 6. The contact defined in claim 1 where
said at least one hole comprises a first and
second axial holes, the first axial hole defining
the open free end for receiving a male contact an
5 the second axial hole defining the open end for
receiving the electrical conductor and further
comprising an electrical conductor inserted into
the second axial hole of the socket body and means
for attaching the socket body to the electrical
10 conductor.

1 7. The contact defined in claim 1 wherein
the socket body is crimped onto the rear portion
of the spring contact.

1 8. The contact defined in claim 1 wherein
the free end of the socket body is rolled over to
extend radially inwardly beyond the forward end of
the spring to prevent removal of the spring from
5 the hole and to center a mating pin contact.

1 9. A female contact comprising:

 a tubularly shaped body member
defining a first axially disposed blind
bore with a free end for receiving a
5 male contact and a second axially
disposed blind bore sized and shaped to
receive an electrical conductor; and

 a male contact engaging spring
seated entirely in the first bore, the
10 spring having front and rear portions,
the front portion of the spring having a
female coupling portion adjacent to the
free end and the rear portion of the
spring and the socket body having
15 cooperative securing means for securely

holding the spring in fixed position
within the body member.

1 10. The contact defined in claim 9 wherein
the cooperative securing means comprises a
selected portion of the tubularly shaped wall
being roll formed into the rear portion of the
5 spring.

1 11. The contact defined in claim 9 wherein
the first blind bore has an inwardly projecting
shoulder, the rear portion of the spring seating
against the shoulder to inhibit rearward movement
5 of the spring within the bore of the body.

1 12. The contact defined in claim 9 further
comprising a male pin adapted to be inserted into
the front female coupling portion of the spring,
the female coupling portion having a plurality of
5 forwardly projecting fingers which are arranged
to engage the male pin inserted therebetween in
close proximity to the free end of the socket
body.

1 13. The contact defined in claim 12 wherein
the fingers engage the male pin within about .025
to 0.45 inches from the free end of the tubularly
shaped member.

1 14. A male/female contact system for
coupling a male pin contact to a female socket
contact, comprising:

5 a tubular socket member having a
first hole therein with an open free
end for receiving the male pin contact
and a second hole therein sized and
shaped for receiving an electrical
conductor;

10 a pin contact; and

 a tubular spring member seated in
the first hole of the tubular socket
member establishing a tight fit therein
to prevent movement of the spring
15 member relative to the tubular socket
member, the spring member having a
forwardly extending female coupling
portion terminating adjacent the open
free end of the first hole, the male

20 pin being inserted into the open free
end and grasped by the female coupling
portion.

1 15. The male/female contact system defined
in claim 14 wherein the tight fit between the
socket and spring members is established by burrs
on one of the members which dig into the other
5 member.

1 16. The contact defined in claim 14 wherein
the spring member has an indentation and the
tubular socket member has a cooperative
indentation seated therewith for securely holding
5 the two members together.

1 17. The contact defined in claim 14 wherein
the female coupling portion grasps the male
contact within about .025 to .045 inches of the
first end.

1 18. A method for making a female socket
contact comprising the steps of:

providing a tubular spring member
having a rear end and a female coupling
5 portion at a forward end;

providing a socket body with bore
having a wall, a free open end for
receiving the spring member and a
conductor receiving end;

10 inserting the spring member
entirely within the socket body with
the female coupling portion adjacent to
the free end;

15 crimping the socket body wall onto
the spring member to push a portion of
the socket body wall into the spring
member to hold the two together;

providing an electrical conductor;

20 inserting the electrical conductor
in the socket body at the conductor
receiving end; and

crimping the socket body wall
onto the conductor.

1 19. The method of claim 18 further
comprising the step of:

providing a male contact; and

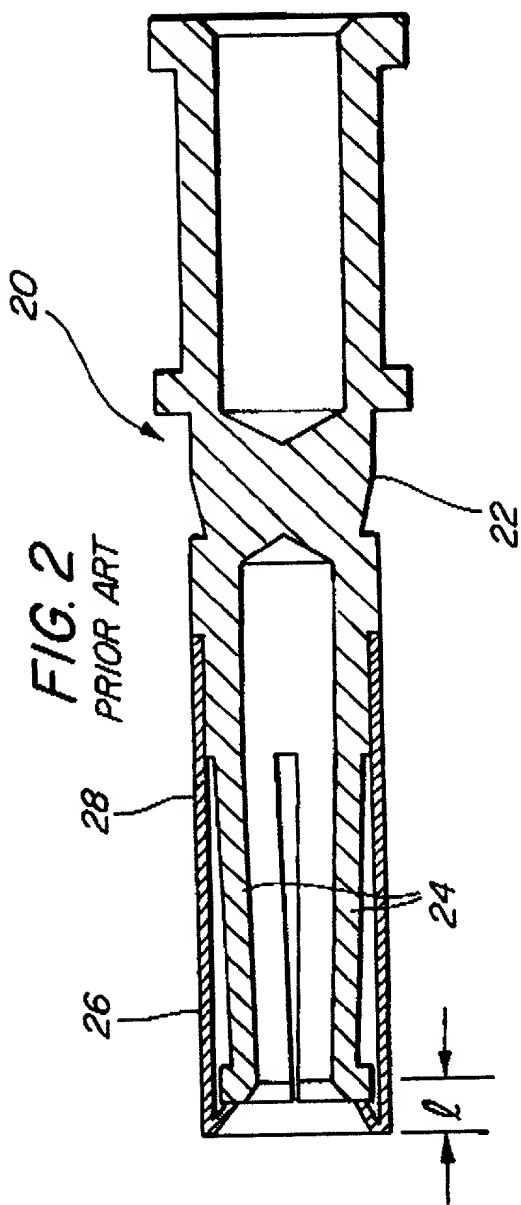
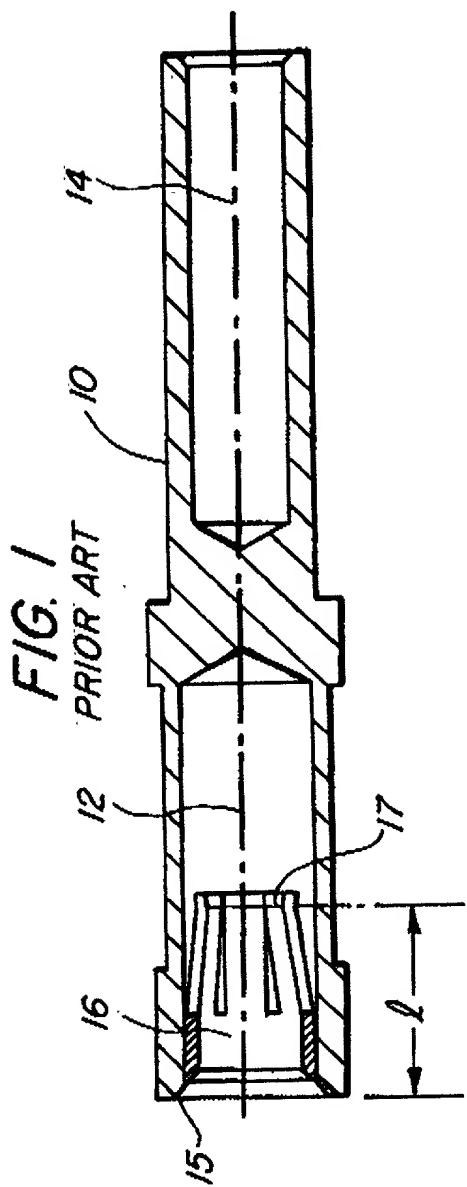
inserting the male contact into
5 the spring contact female coupling
portion establishing an electrical
coupling therebetween.

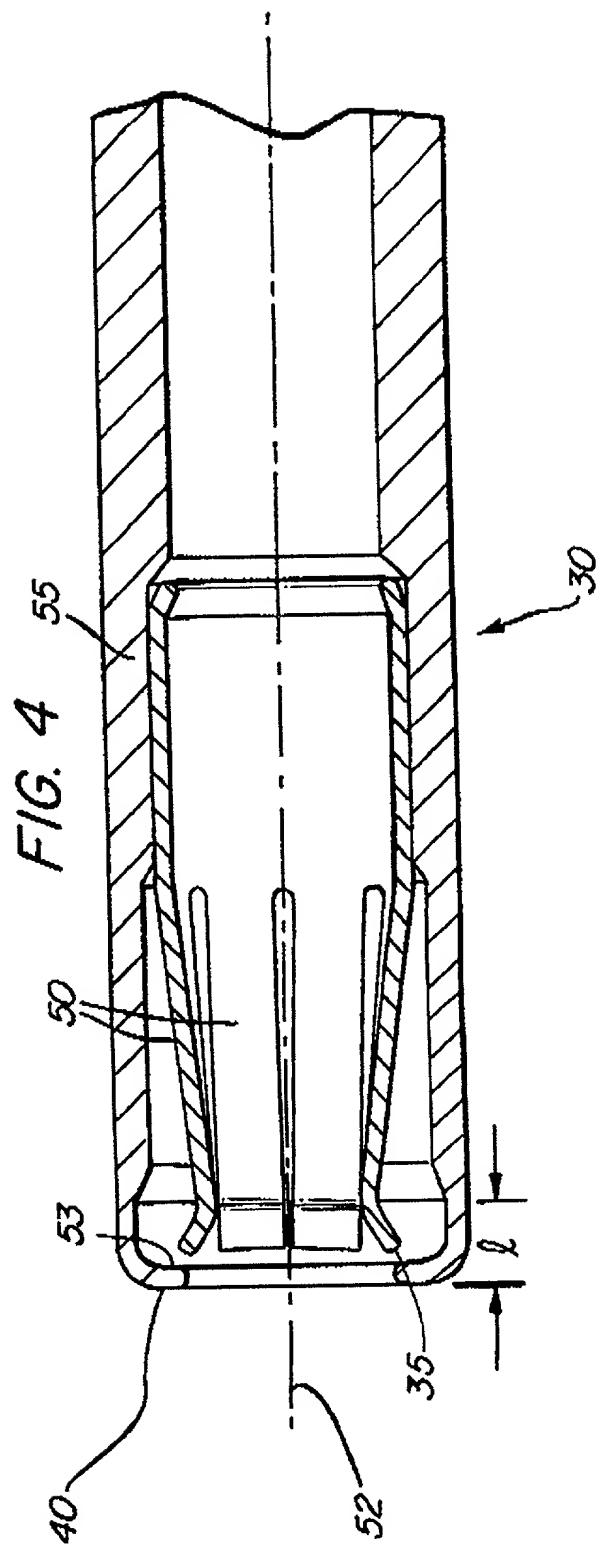
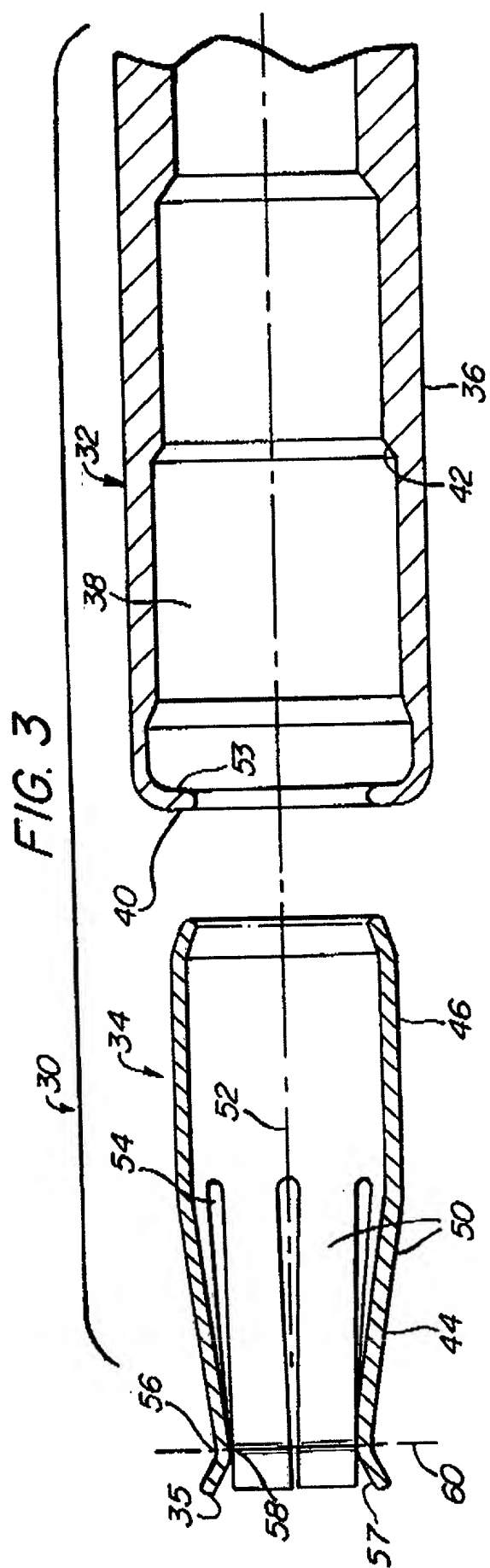
1 20. The method of claim 19 wherein the spring
member is formed with a female coupling portion in
the form of a plurality of resilient fingers which
are spread apart upon the insertion of the male
5 contact.

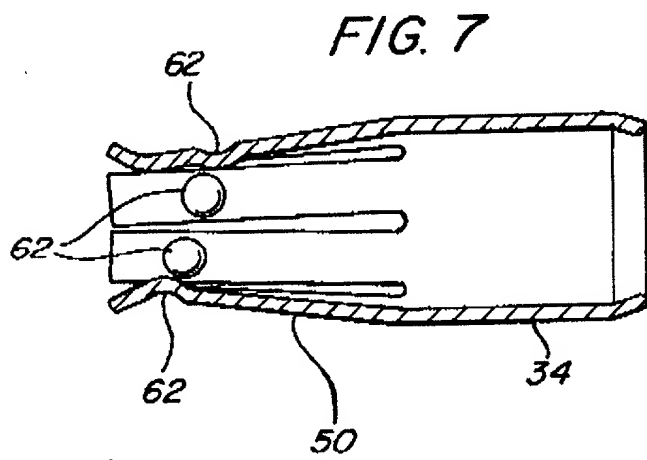
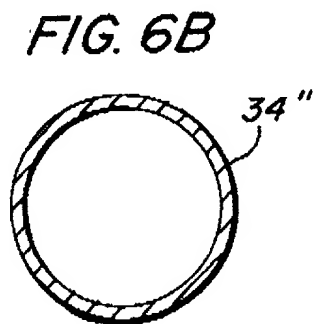
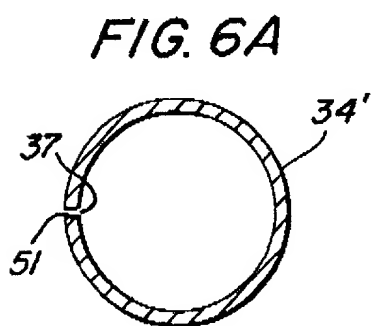
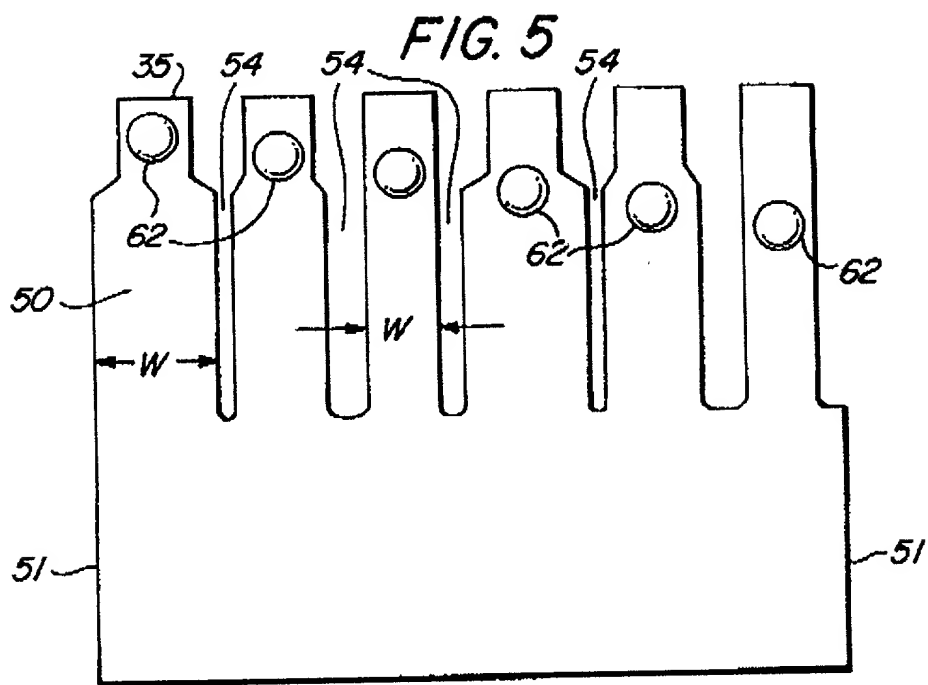
1 21. The method of claim 20 wherein the
plurality of resilient fingers of the spring
member have a proximal end positioned adjacent the
open spring receiving end of the socket body bore
5 and further including the step of rolling the wall
of the socket body adjacent the free spring member
receiving end to form an inwardly projecting
shoulder which limits the outward movement of the
proximal end of the resilient fingers to thereby
10 inhibit damage to the spring by an oversize mating
male pin.

ABSTRACT OF THE INVENTION

1
2 A connector terminal is disclosed
3 including a cylindrical socket body with a
4 spring contact inserted therein. The spring
5 contact has a distal portion that
6 establishes a press fit with the socket body.
7 The socket body may be crimped over the
8 distal portion to more securely hold the
9 spring contact in the socket body. The spring
10 contact further has a plurality of fingers
11 which taper forwardly and inwardly to
12 resiliently grab a male pin as it enters the
13 socket.
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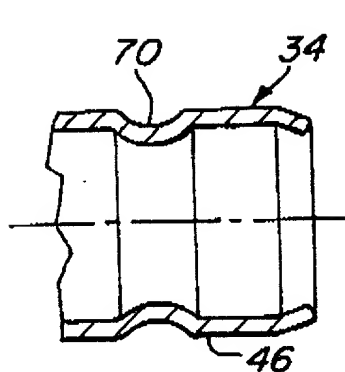


FIG. 8A

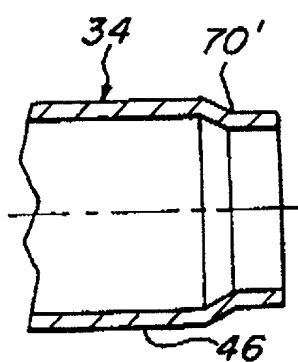


FIG. 8B

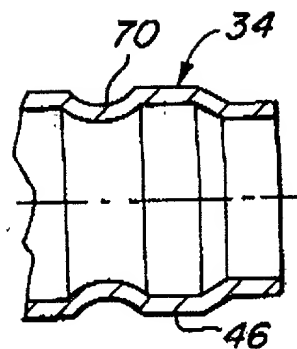


FIG. 8C

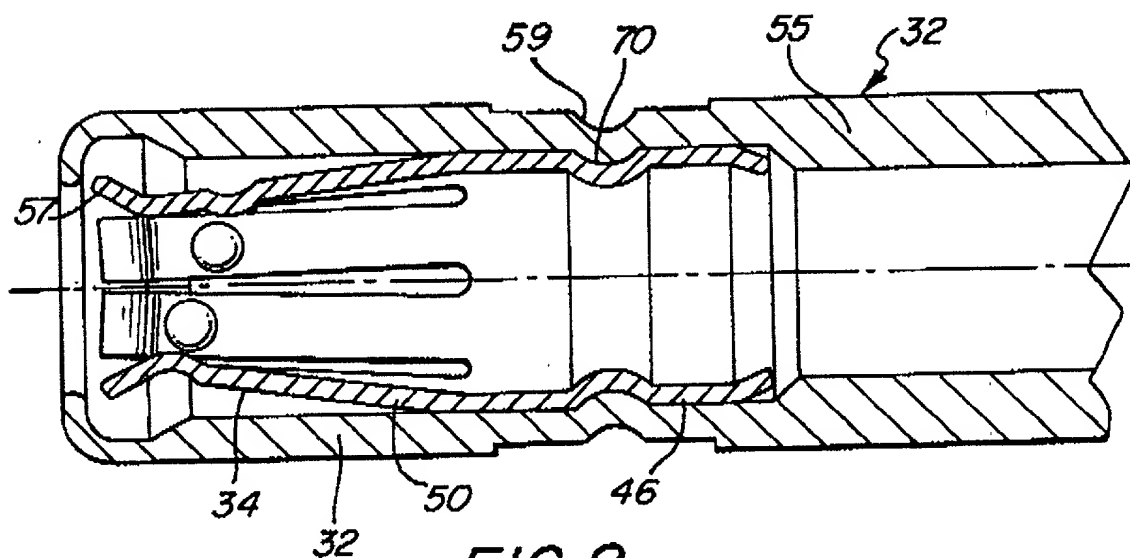


FIG. 9

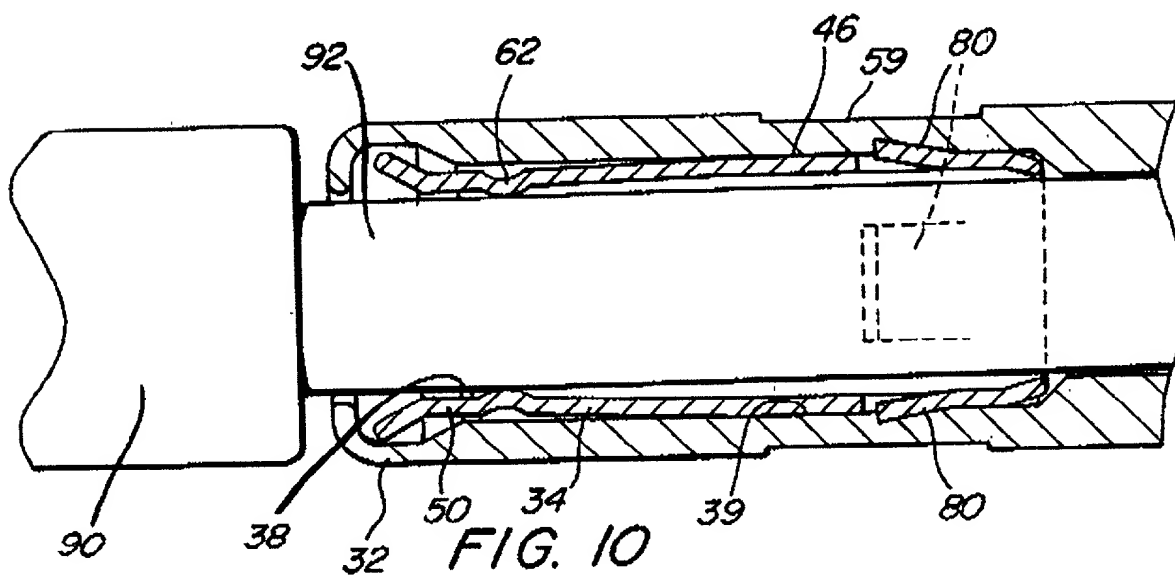


FIG. 10

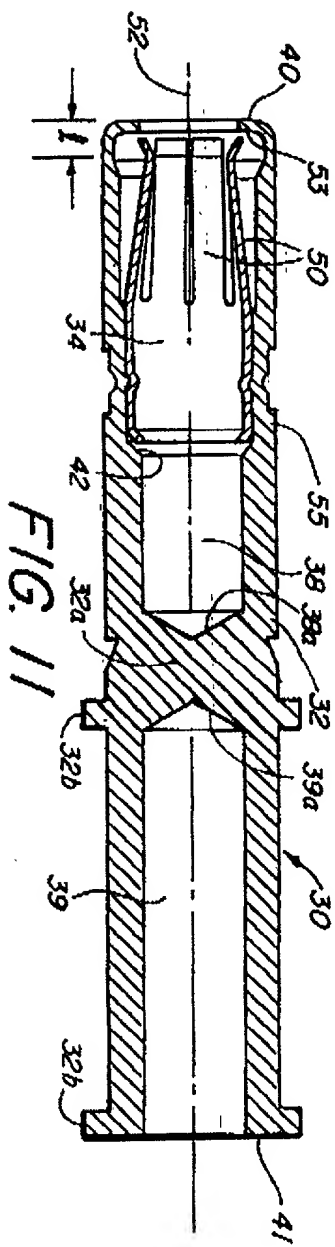


FIG. 11

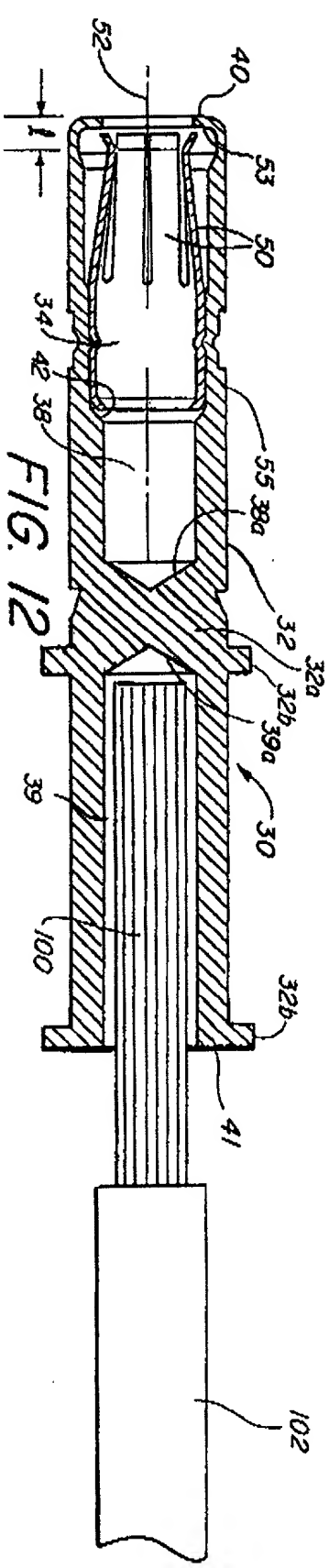


FIG. 12

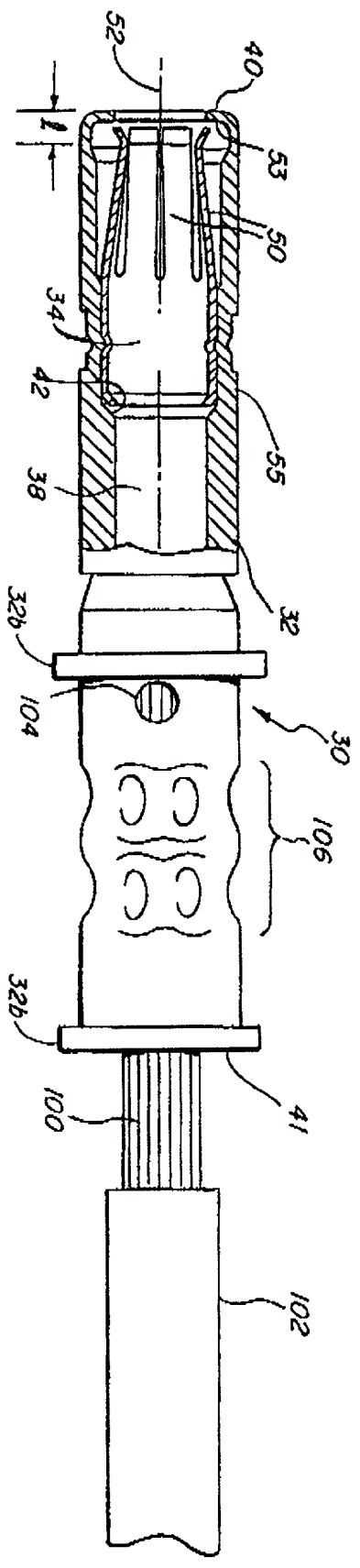


FIG. 13

COMBINED DECLARATION AND POWER OF
ATTORNEY IN CONTINUATION-IN-PART APPLICATION

Atty Docket
TRI3-L92a

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that I verily believe that I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: HOODLESS ELECTRICAL SOCKET CONTACT the specification of which:

(check one) [X] is attached hereto.

[] was filed on _____ as

Application Serial No. _____

and was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Foreign Application(s), if any, for Patent or Inventor's Certificate Filed Within 12 Months Prior to the Filing Date of This Application:

Country	Application No.	Date of Filing (day, month, yr)	Priority Claimed Under 35 U.S.C. 119
None _____	_____	_____	Yes _____ No _____

All Foreign Applications, if any, for Patent or Inventor's Certificate Filed More Than 12 Months Prior to the Filing Date of This Application:

Country	Application No.	Date of Filing
None _____	_____	_____

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(1) which occurred between the filing date of the respective prior applications and the national or PCT international filing date of this application:

09/104,733
Application Serial No.

June 25, 1998
Filing Date

Pending
Status (patented, pending,
Abandoned)

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Harold L. Jackson (Reg. No. 17,766)

Send correspondence to:

Jackson Law Corporation
14751 Plaza Dr., Ste. N
Tustin, California 92780
(714) 832-2080

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF SOLE OR FIRST INVENTOR
Leslie Laszlo Kerek

INVENTOR'S SIGNATURE

DATE

Leslie Laszlo Kerek 9.9.99

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